ISSN 0972-2351

Agricultural Technology Information Centre

Activities & Achievements

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Kerala, India.

natp

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE (ATIC)

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Agricultural Technology Information Centre: Activities & Achievements

Published by

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ISSN : 0972-2351

CMFRI Special Publication No. 76

Citation Style:

Sathiadhas, R. and Sheela Immanuel, 2003. *Agricultural Technology Information Centre: Activities and Achievements, 41 p.* Central Marine Fisheries Research Institute, Cochin.

Cover Design
N.S. Balju

Collage
A.P. Sunil Kumar

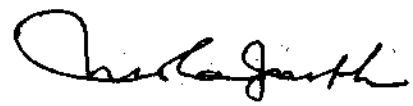
Printed at
Nigeena Printers & Publishers
[illegible]
Phone: [illegible]

FOREWORD

Development efforts over the last few decades have demonstrated that sustained improvements in the productivity and livelihood depend on the technological development and refinement made by the National Agricultural Research System in India. Information is considered to be a basic necessity for development in any sphere of activity. Communication of information has prime importance in the present information age. It is a fact that several useful technologies evolved are still remaining within the research system. Thus it is evident that a chronic information crisis exists at the linking stage mostly at the clientele system in spite of the information technology revolution. The Agricultural Technology Information Centre (ATIC) has a key role to play in bridging the gap between information generation and dissemination. The ATICs established in 40 centres located in ICAR Institutes and State Agricultural Universities are serving the farming community in solving their multi-pronged problems under a single window delivery system.

The Central Marine Fisheries Research Institute (CMFRI) is the premier fisheries research institute carrying out multi-disciplinary research in marine capture and culture fisheries for the past fifty five years. It has developed several technologies and contributed substantially for the development of the fisheries sector. In an earnest attempt to quickly transfer the technologies generated by the scientists, the CMFRI conducted about 45 Fishermen- Farmers- Industry- Institution meets on various focal themes at village level on different locations of the country. The ATIC was granted to CMFRI during December 1999 under the National Agricultural Technology Project (NATP). In addition to the technology transfer programmes, the ATIC has initiated a number of extension activities including diagnostic services, supply of inputs and expert guidance. Research and technology development are continuous processes and must get updated and refined through feedback from end users. The ATIC, to a greater extent, is fulfilling these objectives.

I am fully confident that this publication will serve as a useful reference for the researchers, extension workers and developmental personnel working in this field. I wish to record my appreciation of the efforts made by Dr. R. Sathiadhas, Ms. Sheela Immanuel and their team in the Socio-Economic Evaluation and Technology Transfer Division (SEETTD) for bringing out this excellent publication.



Cochin
15.03.2003

Prof. Dr. Mohan Joseph Modayil
Director, CMFRI

PREFACE

India is primarily an agrarian country and nearly 65 percent of its population depends on agriculture and allied activities for livelihood security. Fisheries alone currently contributes to about 1.3 per cent of our GDP with forex earnings of about Rs. 6500 crores annually. Marine fish production in the country stood at 2.70 million tonnes during 2000-2001 as against the estimated potential yield of 3.9 million tonnes. The Indian coastal stretch of 8129 km along with vast inshore bays, backwaters, estuarine and the brackish water region offers immense potential for fisheries development and coastal aquaculture.

The fishery scenario in India has registered commendable performance over the last three decades. Various technologies developed since independence have succeeded in bringing out significant improvement and change in a range of commercial activities such as seed production, hatchery technology and other fishery enterprises. Easy accessibility of technological information is essential in the decision making process for effective farm management to maximize production with minimum cost and to obtain optimum profit.

The proven 'lab' technologies developed by the scientific community need to be extended to a wider rural domain for their commercialization. Location specific tested technologies for increasing the level of production have only limited accessibility to the farmers of rural sector or interior villages mainly due to lack of proper communication or dissemination outlets. This can be rectified only by transferring such technologies to the rural farmers in a systematic and sustainable manner. Once transferred, there should be continuous support of information package for the smooth take off of the technologies.

Technological information in the present milieu of information explosion is a pre-requisite for fishery based development and planning. The comparative advantage of capture and culture fisheries along with the value added food processing sector should be fully exploited for the labour-intensive rural economy of India. Efficient information infrastructure is a sound base for participatory decision making process and subsequently the development of primary sector. Thus, ATIC, which could cater needs of the farthest farmer, is endowed with the motto of serving even the marginal farmers with the most updated and useful information for technology-induced decision making and its adoption through a single window delivery system.

I wish to express my sincere gratitude to Dr. S.L. Mehta, National Director, NATP, Dr. P. Das, DDG, (Agrl. Extension), Dr. S. Ayyappan, DDG. (Fisheries) and to Dr. Aditya N. Shukla, ADG (KVK) of ICAR, New Delhi and to Dr. R.K. Samantha, Zonal Co-ordinator, Unit VIII of TOT, Bangalore, for their constant encouragement and guidance in the successful implementation of this programme. I am extremely thankful to Prof. Dr. Mohan Joseph Modayil, Director, CMFRI for his keen interest and concerted efforts in developing this centre and critically going through the manuscript of this document I am highly thankful to Dr. K.K. Appukuttan, Nodal Officer and other Staff of NATP Cell of CMFRI for their key role and support. Thanks are also due to Ms. Sheela Immanuel, Dr. V.P. Vipinkumar, Ms. T.N. Ananthalakshmy and other staff of Socio Economic Evaluation and Technology Transfer Division (SEETTD) for their sincere involvement and services in effectively organizing ATIC activities.

Cochin
15.03.2003

Dr. R. Sathiadhas
Head, SEETT Division

CONTENTS

1

THE MISSION

'WITH THE DIVERSIFICATION AND MODERNISATION OF AGRICULTURAL PRACTICES THERE IS A NEED TO AUGMENT SUPPORT AND EXTENSION SERVICES FOR AGRICULTURE..... THIS WILL STRENGTHEN TRANSFER OF TECHNOLOGY AND EXTENSION SERVICES AND ALSO PROVIDE SELF EMPLOYMENT OPPORTUNITIES'

BUDGET SPEECH OF UNION FINANCE MINISTER, 2000-2001

The Agricultural Technology Information Centre (ATIC) provides a vital link between the technology developers and end users. The propensity to develop and apply science coupled with the acceptance of innovations by primary producers leads to technological progress and economic prosperity. Dissemination of modern technological innovations with appropriate extension strategies empowers the farming community to enhance the productivity and thereby disposable income of households and food security of the Nation.

The National Agricultural Technology Project (NATP) attaches paramount importance in shifting emphasis from commodity research towards production system research, enhancing sustainability of production systems, development of institutional partnerships, introduction of new approaches to technology dissemination including decentralised management and strengthening the linkages among research, extension and farmers. The establishment of ATIC in different regions of the country takes care of this important aspect of location specific technology dissemination to farmers which helps to address the constraints within the existing technology transfer system. This further helps to accelerate the flow of skills from technology mentors to the farmers, which in turn contributes to the productivity and sustainability. In the present information age, development of appropriate package and its quick dissemination are equally important. Location specific, labour intensive technologies are highly ideal for India for optimum utilization of our natural and human resources. Technological progress and its adoption by stakeholders are necessary for poverty alleviation and equitable distribution of income. Coordination between the researchers, extension workers and technology users is a felt need in every area of the rural development programmes in agriculture and fisheries.

Marine fisheries contribute substantially to the Indian economy by way of supply of protein rich food, employment

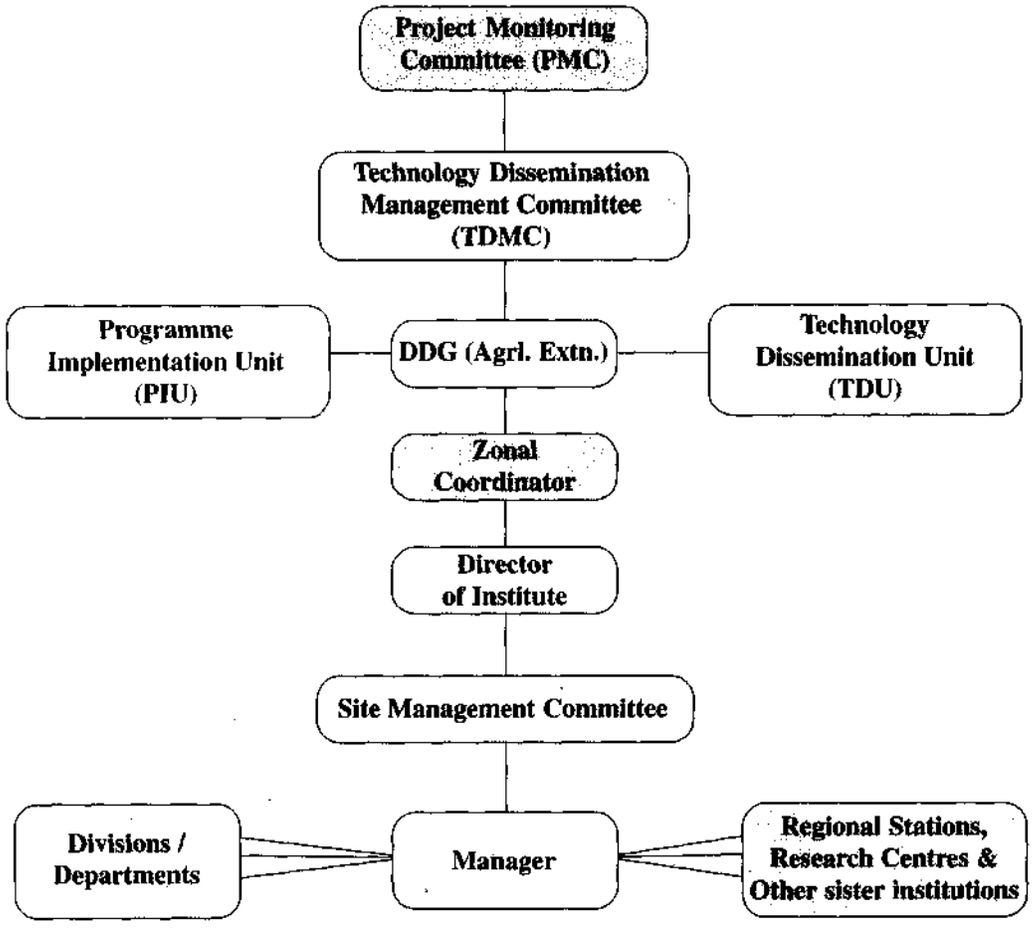
generation and foreign exchange earnings. India ranks 6th in world fish production and marine fishing industry is one among the prime industries in India. Among the countries bordering the Indian Ocean, India is the largest and it contributes to about 45% of marine fish production from the Indian Ocean. The total export earnings of the country by marine products alone was Rs. 6,500 crores during 2000-2001 which contributed to the largest share (21.6%) of the total value of agricultural exports. Emphasis for the development of fisheries and resource allocation for research have been increasing in the successive Five-Year Plans.

The fisheries resources are renewable but not inexhaustible. The Exclusive Economic Zone (EEZ) of India is 2.02 million km^2 as against the land area of about 3.2 million km^2. Many fishing technologies with different craft-gear combinations are being used to harvest our valuable marine resources. However, the multi-gear, multi-species marine fisheries pose several management problems warranting proper dissemination of information to fishermen to adopt appropriate strategies for exploitation and conservation. With the help of satellite imageries, the abundance of certain species in specific potential fishing zones are easily located requiring rapid information dissemination for prompt harvesting. The information in the marine fisheries calendars enable the fishermen to catch the specific resources using appropriate and sufficiently efficient craft-gear combinations to obtain maximum catch and profit. The burgeoning demand for fish and fishery products and their increased value have led to massive increase in fishing pressure in our open access marine fisheries. The demand driven high priced varieties are subjected to target fishing and destructive fishing requiring formulation and implementation of regulatory measures. There is need to formulate and adopt appropriate management measures to ensure sustainability and renewability of the marine resources. Information on the price of different varieties of fish in various regions and markets further helps the fishermen to get maximum value for their products. The tremendous scope for sea farming also requires the dissemination of technical know-how and active uptake by the fisher folk.

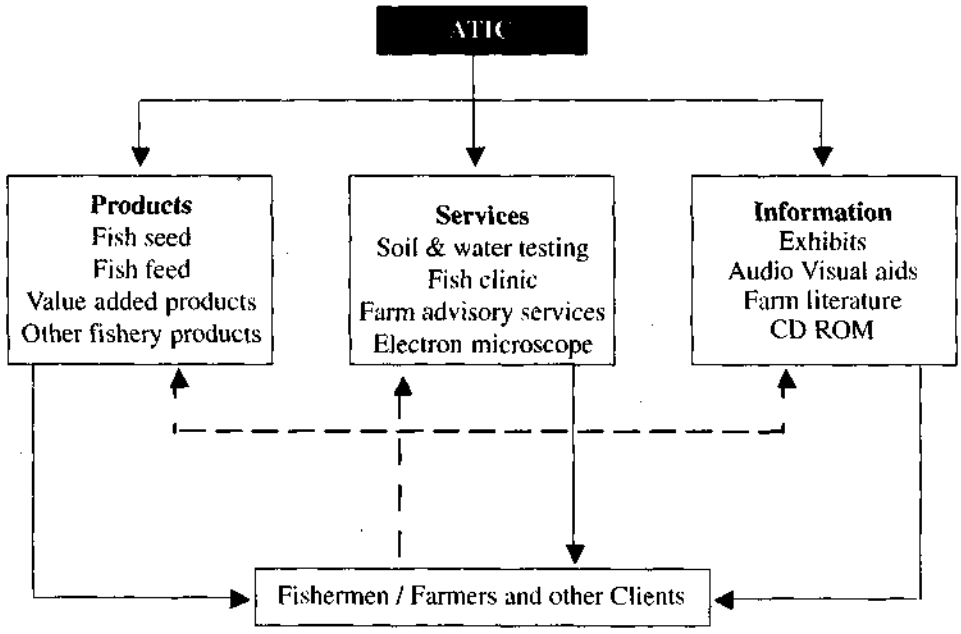
Our country is further blessed with 27,000 kms of rivers, 1,13,000 kms of canals, 1.75 million hectares of reservoirs and over 2.86 million ha. tanks and ponds providing huge opportunities for the development of aquaculture. In the brackish water segment alone, out of the 1.2 million hectare of potential area available for aquaculture, hardly 10% is utilized. The current scenario of totally shrimp-oriented coastal mariculture has not led to the promotion of potential alternatives such as culture of bivalves seaweeds, crabs and several finfishes. Hence our effort for increased fish production requires to be diversified and broad based to take advantage of the high production potential of tropical aquaculture. There is also urgent need for commercial production of low cost fish and shrimp feeds developed by the research institutions to improve the productivity and profitability. Prevention, diagnosis and treatment of diseases also require attention by means of adopting recommended health management practices.

It is well known that the economic growth and development are closely tied with the development of agriculture. The Indian Council of Agricultural Research (ICAR) has approved establishment of 40 Agricultural Technology Information Centres in its Research Institutes and State Agricultural Universities with the objective of serving the farmers in the country with first hand information and technological inputs. The facilities of ATIC are open to all categories of fishermen / farmers enabling them free access to the facilities and services. The ATIC of CMFRI gives special emphasis for technology transfer in capture and culture fisheries in the marine sector.

MANAGEMENT STRUCTURE OF ATIC



FUNCTIONAL STRUCTURE



The Central Marine Fisheries Research Institute is one of the 40 institutions identified for the implementation of the project entitled *"Establishment of Agricultural Technology Information Centre (ATIC)"* during Phase II under National Agricultural Technology Project (NATP). The Centre is located at the Central Marine Fisheries Research Institute, Cochin, Kerala.

Display of TOT publications

2

AN OVERVIEW OF CMFRI

The CMFRI is one of the premier research institutes involved in carrying out multi-disciplinary research both in capture and culture fisheries. It was established in 1947 by the Govt. of India under the Ministry of Food and Agriculture with its Head-Quarters at Madras and later shifted to Mandapam Camp in 1949 and to Cochin in 1971. In 1967 the administrative control of the Institute was transferred to the ICAR. The CMFRI is one of the 8 National Institutes under ICAR fisheries research networks. The mandate of the Institute is as follows:

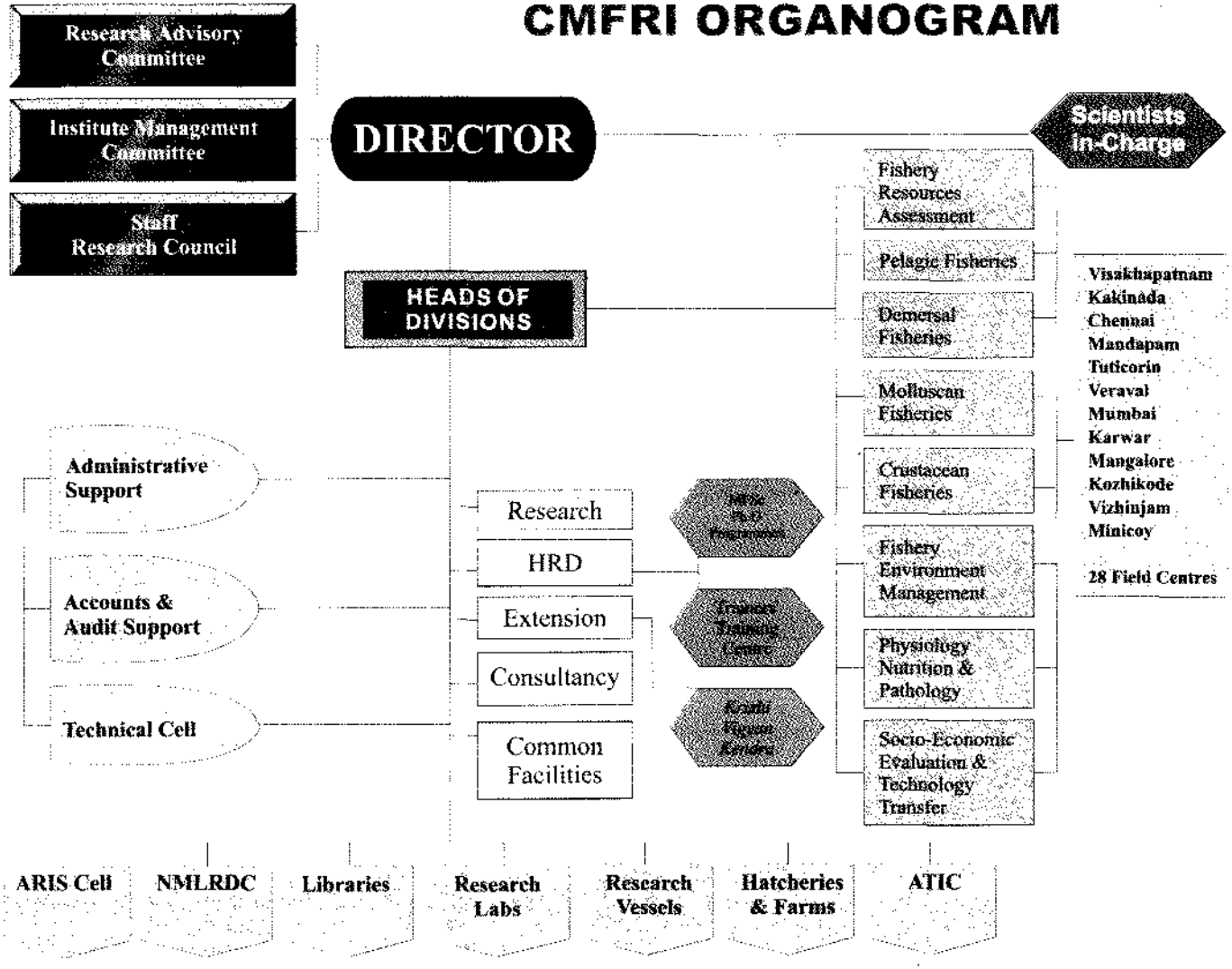
CMFRI, Headquarters at Cochin

Mandate

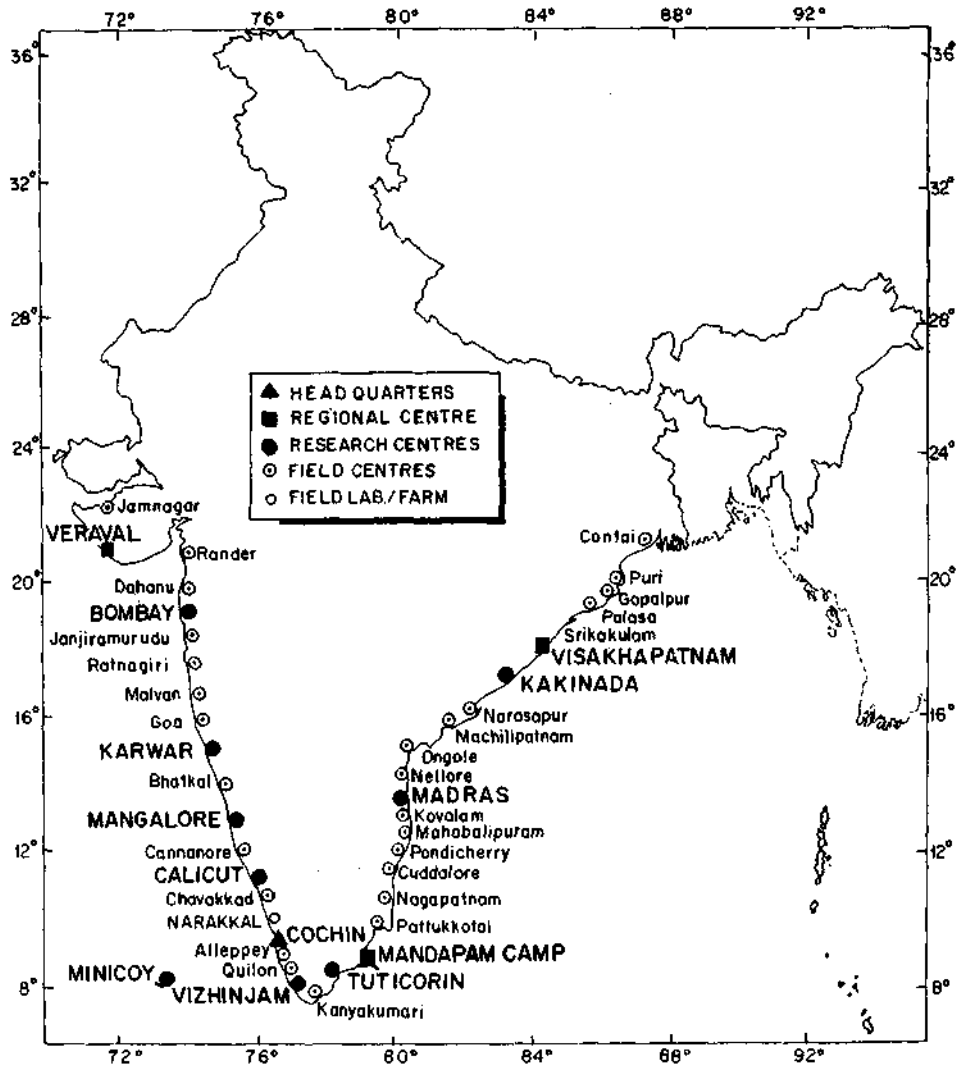
- To monitor the exploited and assess the under- exploited resources of marine fisheries resources of the Exclusive Economic Zone
- To understand the fluctuations in abundance of marine fisheries resources in relation to change in the environment
- To develop suitable mariculture technologies for finfish, shell fish and other culturable organisms in open seas to supplement capture fishery production
- To act as a repository of information on marine fishery resources with a systematic database
- To conduct transfer of technology, post graduate and specialized training , education and extension education programmes
- To provide consultancy services

To effectively carry out the mandate, the Institute has established three Regional Centres, nine Research Centres and 28 Field Centres all along the coast. The entire activity is co-ordinated by the Headquarters at Cochin. The Institute has built up adequate laboratory and office facilities for carrying out the research programmes. The Institute has its own central library at Cochin with the Regional and Research Centres having their own library facilities.

CMFRI ORGANOGRAM



Establishments of Central Marine Fisheries Research Institute



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RESEARCH DIVISIONS AND ACTIVITIES

Multidisciplinary research in capture and culture fisheries in marine sectors are conducted under eight divisions. Inter divisional programmes with collaborating agencies are carried out for greater utilization of experts and facilities. The brief research activities in the eight divisions are as follows:

Fishery Resources Assessment Division (FRAD)

The division is responsible for collection of fisheries statistics from all along the Indian coast for making region-wise and species-wise stock assessment of marine fishery resources. It is also involved in development of models and methods for assessment and evaluation of exploited stocks. Management of the National Marine Living Resources Data Centre (NML RDC) and database on the exploited marine living resources is also done by the Division.

Pelagic Fisheries Division (PFD)

The research in this division is aimed at studying the fishery and biological characteristics of oil sardine, Indian mackerel, bombay duck, seer fish, tuna, ribbon fish, skates and pomfrets. The fluctuations in abundance resulting from changes in the environment are continuously monitored. Investigations on live bait resources for the pole and line fishery of tunas at Lakshadweeep are also carried out. The research findings lead to the understanding of the recruitment, growth and mortality of each species and finally to advise on the maximum sustainable yield of all exploited species of pelagic fish.

Demersal Fisheries Division (DFD)

This division is concerned with research both in capture and culture fisheries. The investigations on capture fisheries include monitoring the landings, studying biological characteristics such as maturation, spawning, fecundity, food and growth, estimation of mortality rates, stock sizes and maximum sustainable yield of important demersal resources such as croakers, thread fin breams, silver bellies, cat fishes, lizard fishes. goat fishes, groupers, snappers, pig face breams, threadfins, flat fishes, sharks, rays and research in culture fisheries including breeding and rearing of sea bass and groupers.

Crustacean Fisheries Division (CFD)

This division is responsible for monitoring the landings and biological characteristics of penaeid and non-penaeid prawns, lobsters and crabs. Researches are directed to understand the dynamics of the constituent species, and to give advice on rational exploitation. The activities of the division also include breeding and culture of lobsters and crabs, development of hatchery technology and sea – ranching of penaeid prawns. This division also extends consultancy on setting up of hatcheries.

Molluscan Fisheries Division (MFD)

Monitoring the landings of squid, cuttlefish, gastropod and bivalves and researches on stock characteristics of these resources are the areas of work focussed in capture fisheries by this division. The major thrust areas in culture fisheries are development of hatchery technology, sea ranching, culture of oysters, clams and

mussels. Maintenance of stocks of pearl oysters, pearl culture using tissue culture techniques, demonstration of edible oyster culture in certain places, and location testing for the same all over the Indian coasts are among the major ongoing research programmes of this division.

Fishery Environment Management Division (FEMD)

The research programmes include studies on hydrography, plankton production and marine pollution. Using the research vessels, the environmental characteristics in the EEZ are investigated and the relationship between fish abundance / availability and various oceanographic characteristics are studied. The division is participating in the programme of *Marine Remote Sensing Information System* at Cochin in collaboration with National Remote Sensing Agency of the Department of Space. The data on potential fishing zones are analyzed for the development and improvement of remote sensing techniques in fisheries. Location testing and culture of seaweeds and seed production and sea ranching of sea cucumbers also form the major research programmes of the division.

Physiology, Nutrition and Pathology Division (PNPD)

In order to improve the various technologies of mariculture, this division conducts researches on cryopreservation of gametes of cultivable fishes and shellfishes, endocrinological factors influencing maturation of marine prawns, physiological behaviour of some cultivable organisms in relation to changing environmental characteristics, farm trials of compounded feeds , identification and control of diseases in culture systems and genetics of commercially important penaeid prawns, fishes and molluscs.

Socio-Economic Evaluation and Technology Transfer Division (SEETTD)

This division is mainly involved in carrying out research in Fisheries Economics and Fisheries Extension. In fisheries economics, data are regularly collected on costs and earnings of different craft-gear combinations all along the coast in capture fisheries and input-output details of various aquaculture practices in different regions. Information on market infrastructure and price structure of all commercially important marine fishes are regularly collected and studies on socio – economics of coastal fisherfolk are given due importance.

Fisheries Extension research is mainly focussed on gender issues, marine fisheries conservation and management, designing and validation of communication strategies to promote the ethos of responsible fisheries, documenting of indigenous knowledge base for community based resource management and empowerment of coastal communities through transfer of technology programmes. Technology Assessment and Refinement (TAR) through Institution Village Linkage Programme (IVLP) is the other major extension activity. Participating in exhibitions, conducting training modules to endusers and other out reach programmes are also taken up. Organising interface meetings of technocrats, financial institutions and farmers is a regular activity of the division.

Education

Under the Postgraduate programme in mariculture, the Institute conducts M.F.Sc and Ph.D programmes. The teaching programme is carried out by the scientists of the Institute. The course programmes cover comprehensively both basic and applied aspects of the subject including dissertation.

Training programmes

The Institute is regularly organising need based training programmes in marine capture and culture fisheries for the use of fishermen/ farmers and other end users under the Krishi Vigyan Kendra (KVK) and Trainer's Training Centre (TTC). The training programmes include subjects such as fisheries statistics and population dynamics, hatchery production of prawn seeds, SCUBA diving, prawn culture, crab culture and fattening, pearl production, mussel and other bivalves, ornamental Fish culture and seaweed culture.

Training programme on 'Fish diseases and their management' for MPEDA officials

Laboratory facilities

The laboratory at headquarters and research centres are adequately equipped with facilities such as compound microscope, binocular microscopes, binocular –stereo-zoom microscopes, cameras with close-up lenses, electronic balances, refrigerators, deep freezers, ovens, incubators, spectrophotometers, calorimeters, pH meters, autoclaves and several other facilities to carry out research in the laboratories and to collect hydrographic data and plankton at onboard research vessels. Atomic absorption spectrophotometer, amino acid analyzer and fully equipped radio isotope laboratory are the other major facilities at headquarters.

A transmission – cum- scanning electron microscope is functioning in the Institute at Cochin to tackle certain frontier areas of fishery research. Marine fish farm and prawn hatcheries are located at Mandapam Camp and a shellfish hatchery is available at Tuticorin. A running sea water aquarium is maintained at the Regional Centre for facilitating researchers to make observations on fish behaviour, controlled breeding and physiological aspects.

Computer facilities

The National Marine Living Resources Data Centre (NMLRDC) at the Institute receives fisheries statistics collected from all over the Indian coasts on a continual basis from the Research and Field Centres of the Institute. This facility is used for efficient analysis, storage and retrieval of data, for providing computing facilities to scientists for cataloguing and documenting in the library and for speeding up the disposal of work in the administrative and accounts sections in the Institute.

Research vessels

Currently two mechanised vessels (*cadalmin*) of OAL 13.4m of the Institute are carrying out fishery and oceanography

researches in the inshore area upto 50-m depth. The Vessel Management cell at Head Quarters coordinates the operation and maintenance of the vessel.

Museum

At the Head Quarters and the Regional Centre at Mandapam, reference collection museums are available. Specimens of sponges, corals, echinoderms, polychaetes, shrimps, lobsters, crabs and fishes belonging to a large number of species from all along the Indian coasts are preserved and stuffed specimens of large fishes, turtles, marine mammals are also displayed. They serve the purpose of reference material to scientists of the institute as well as outsiders.

TECHNOLOGIES DEVELOPED BY THE INSTITUTE

With the continuous research effort of the scientists of the Institute since its inception, the CMFRI has been able to come out with proven technologies in both capture and culture fisheries. Some of the most important achievements attained by the Institute are mentioned below.

a. Shrimp farming

The Institute has developed the technology for scientific shrimp farming during 1970s and now this venture is undertaken on commercial basis in different parts of the country.

An ideal shrimp farm

This technological progression has led to the increase in shrimp production and thereby enhancing the export earnings of the country.

b. Shrimp feed

The CMFRI has developed a shrimp feed by name *Mahima*, which is a low cost feed with high feed conversion ratio. This can be prepared locally with the easily available raw materials. Field trials have showed very good results and the feed is of high demand in the market. Under the technical guidance of the Institute, three small-scale enterprises were established in Ernakulam District by three women groups.

Preparing shrimp feed

c. Duplex PCR Kit for detection of White Spot Virus

White spot disease caused by White Spot Virus (WSV) is one of the major threats faced by the shrimp farming industry. As there is no cure for this disease, stocking

disease free larvae is one of the management measures recommended to prevent vertical transmission of the virus. The CMFRI, has developed a duplex PCR kit for detection of WSV which is cost effective, faster and reliable compared to the nested PCR kits which are currently being used. Simultaneous PCR screening of different segments of the viral genome is carried out in this technique. The advantages of the Duplex PCR are

Rapidity : While nested PCR is carried out in two stages, duplex PCR is conducted in a single run, thus, reducing time required for the screening.

Cost effectiveness : Since the assay volume and constituents used in the duplex PCR is equivalent to the first run of the nested PCR except for the primers, it is cheaper.

Reliability : Since different regions of the viral genome are amplified and checked simultaneously, it has got high reliability also.

d. Small scale shrimp hatchery

Shrimp farming in India has been undergoing rapid technological transformation and it has gained extensive popularity. The production of quality shrimp seeds in the country is far below the requirement. This situation has enforced the expansion of seed production by setting up of hatcheries of various capacities all along the coast. The small scale or mini hatchery developed by the Institute aims at producing seeds at low cost near the farm site, utilizing locally available manpower. The technology is very simple and can easily be adopted by the coastal fishermen families with some investment and training.

e. Crab culture/ fattening

In India crabs are mostly landed as a by-catch during commercial fishing operations and are used mainly for domestic consumption. However, mud crab has become a highly priced commodity in recent

Harvest of cultured crabs

years. India began to export small quantities of live crab to the Southeast Asian countries in the late eighties. This resulted in a sudden demand for higher production of this commodity and diversified the attention from fishing to farming. Technologies have been standardised by the Institute on commercial scale mud crab farming and fattening and it is picking up in States like Kerala, Tamil Nadu and Karnataka. After farming for a period of 8 to 10 months, crabs weighing more than 800g can be harvested and this fetches a price of Rs. 200 to Rs. 300 per Kg whereas baby crabs are available for less than Rs.40 per kg. At present, crab seeds are not produced in large numbers in hatcheries. Efforts are put forth in setting up of hatchery at the CMFRI for the commercial production of crab seeds.

f. Edible oyster culture

Since the early 70s the CMFRI has taken up R & D programmes on all aspects of oyster culture and as a result a comprehensive package of technology for

Edible oyster farming

oyster farming including hatchery production of the seeds was developed after experimenting for several years on various

Edible oyster strings

methods. In one hectare area, 125 to 145 racks can be constructed (24 units of 300 m^2 each). At the end of 7-8 months, each string yields 4-5 kg oyster and the production is estimated at 80-105 tonnes per hectare per crop. The meat yield is about 10 percent of the total weight. The increasing demand and high price of the oyster meat in the international market is quite an encouraging factor for wider adoption of this technology.

g. Pearl oyster farming and pearl production

In India, the CMFRI has conducted a series of experiments and developed several methods of pearl production. The present methods of farming by floating rafts,

Pearl oyster farming

long line, rack and ren methods are suitable for several areas in India. In the seafarming system, two crops can be taken in a year. The standardised viable technology is now popularised through different extension techniques for the benefit of the fishermen community and other entrepreneurs. Consultancy services are also offered by the Institute about pearl oyster farming and production.

h. Artificial Fish Habitats (AFH)

It has long been known that fishes tend to concentrate around drifting and sunken objects such as logs, branches of trees, leaves and ship wrecks. In recent years, many kinds of modern fabricated devices have been installed in the sea with an idea of increasing fish catch as well as preserving artificial fish habitats as an ecosystem. An artificial fish habitat is an object or construction, which promotes an ecosystem and provides a habitat for fishes. In India, interest in commercially viable methods of aggregating fishes is growing

Artificial fish habitat

as the fishery resources in the inshore areas are being intensively exploited. The competition from the trawlers and the depletion of stocks have adversely affected the artisanal fishermen and resulted in reduced income. It is in this situation AFH serves as a device for increasing fish biomass. An impact analysis has shown an increase in the fish catch in the area where artificial reefs are installed . The catch per unit effort is higher in the AFH areas than in the non AFH areas. AFH areas form additional fishing grounds to the artisanal fishermen.

i. Sea weed culture

In India there are about 50 seaweed based industries located in Ahmedabad, Baroda, Cochin, Hyderabad, Madurai and Ramanathapuram. They depend only on natural seaweed beds for their raw materials. As more and more new industries are coming up every year, exploitation rate exceeds the harvestable biomass. The indiscriminate exploitation of these resources from the natural beds leads to stock depletion. Hence mariculture of seaweeds at suitable sites in the Indian Coasts , estuaries and certain backwaters is the only way to increase the production. The Institute has developed technologies for seaweed culture in ropes in the sea and the technological achievements made were propagated among the fishermen community at selected centres of Tamil Nadu, Gujarat and Lakshadweep islands.

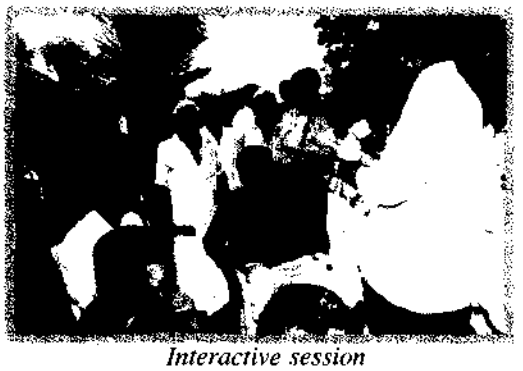
TRANSFER OF TECHNOLOGY

The developed technologies are transferred to the fishermen community through different extension techniques such as front line demonstrations, Fishermen-Farmers- Industry-Institution-Meets, group discussions, group meetings, campaigns, exhibitions and through published literature.

Farmers attending fishermen meet

a. Interface meetings

As a part of transfer of technology, regular "Fishermen-Farmers-Industry - Institution Meets" are conducted every



Interactive session

month. These meetings provided platform to have a very good interaction between the farmers and the scientists. Every month the theme is selected based on the location specific technology. The meetings are conducted in local language. The farmers who are having doubt can clarify their doubts by directly contacting the scientists. A lot of fishermen were made aware of the technologies through these meetings. The details of focal theme of the 45 meetings organised are given below.

b. Supply of Algal inoculum

Feed is the most important component commanding high demand from aquaculturists, which is essential for the growth of mariculture industry in India. Algal inoculum is used for the mass culture of feed for the shrimps, usually given to PL-30 shrimp seeds. Various types of algal inoculum available through ATIC are *Chaetoceros, Telra selmis, Isochrysis* and *Nano chloropsis*. A number of hatcheries are benefited by the supply of algal inoculum. A select list of hatcheries, which are immensely benefited, with the frequent supply of algal inoculum by the ATIC of CMFRI, is also given.

Fishermen Meets conducted

Focal Theme	No. of Meetings	Focal Theme	No. of Meetings
Bivalve culture	8	Artificial reef	1
Integrated mariculture	2	Fisheries management and social issues	13
Shrimp farming	4	Seaweed culture	1
Crab culture/fattening	6	Small scale shrimp hatchery	1
Shrimp feed	3	Fin fish culture	5
Fish disease	1		

Fisherwomen attending skill training on value added fish products

Select List of Hatcheries benefitted by Frequent supply of algal inoculum

Sl.No	Name of Hatchery	Place	State
1	Pace Sea Foods (P) Ltd.	Visakhapatnam	Andhra Pradesh
2	Seaview Prawn Hatchery	Thrissur	Kerala
3	Tradelink Aquaculture (P) Ltd.	Udupi	Karnataka
4	Bala Tripura Sundari Aquaproducts (P) Ltd.	Kakkinada	Andhra Pradesh
5	Raj Kamal Marine Breeding Farms	Visakhapatnam	Andhra Pradesh
6	Aqua Hatch Shrimp Hatchery	Alappuzha	Kerala
7	Laila Aquatech Ltd.	Vijayawada	Andhra Pradesh
8	Marine Water Fry Ltd.	Thrissur	Kerala
9	Matsyafed Hatchery	Kollam	Kerala
10	Santir Aquatic (P)Ltd.	East Godavari	Andhra Pradesh
11	Lotus Sea Farms	Chennai	Tamil Nadu
12	Cochin Aqua Hatchery	Vypeen	Kerala
13	Amalgam Aquaculture Applications Ltd.	Chennai	Tamil Nadu
14	Shoreline Hatchery	Kollam	Kerala
15	S S Hatchery	Kodungalloor	Kerala
16	Sri Venkitesan Hatchery	Bhimavaram	Andhra Pradesh
17	Rency Hatchery	Kollam	Kerala
18	Kerala Hatchery	Kodungalloor	Kerala
19	Natures Way	Alappuzha	Kerala
20	Royal Plaza Hatcheries	Thrissur	Kerala
21	Centre for Fish Disease Diagnosis and Management	Cochin	Kerala
22	Sterling Shrimpex Hatchery	Vadarevu	Andhra Pradesh
23	Matsyafed Prawn Hatchery	Malappuram	Kerala
24	Dr. K. Premchand Hatchery	Guntur	Andhra Pradesh
25	Amalgam Hatcheries	Thiruvananthapuram	Kerala
26	A N S Hatchery	Ayyampilly	Kerala
27	Mas Aqua Techniks (P).Ltd.	Nelloore	Andhra Pradesh
28	Puravi Marine (P) Ltd.	Visakhapatnam	Andhra Pradesh
29	M.L. Hatcheries (P) Ltd.	Kanchipuram	Tamil Nadu
30	Oceanic Shrimping Ltd	Chennai	Tamil Nadu

3

GENESIS AND OBJECTIVES OF ATIC

Genesis

Research organizations are mainly focusing on the development of environmentally and socially compatible technologies for the resource poor farmers to improve their present farming system for increasing the production and productivity. This prime objective of the research organizations is not fulfilled unless the technologies reach the end users. Information about the technological advancements has to be brought to the notice of the end users for its successful adoption. The access of the farming community to the knowledge generation system is very weak and this needs a strong and effective linkage between the two systems. Dissemination of innovation should reach the right farmer at the right place in the right time. Time lag in technology adoption may not give the expected results. In fisheries some technologies are not brought to the knowledge sphere of the fishermen and the benefits are not derived to its fullest potential due to lack of proper dissemination of information.

The ATIC plays a very substantial role to bridge the gap between the fishermen and researchers. Easy access of the farmers to utilize the facilities of the Centre can help the fishermen /farmers to gain first hand information about various technologies. The concept of single window support system helps farmers to get the information and services quickly and it also minimizes the dissemination loss.

The dynamics of economic development in any country depends directly on the amount of resources available, their quality and productivity, the extent to which they are used and their growth in both quantitative and qualitative terms. The knowledge of farmers can be enriched through effective sharing of information and diffusion of technology in a befitting manner.

The socio-economic improvement of fishermen is the eventual objective of all fishery development schemes. Coastal fishing villages in general are backward and the only scope for their income generation is through fishing and related activities. The need for development of infrastructure facilities, revitalization of cooperative movement, fixation of support prices, measures to reduce pollution problems and opportunity for supplementary occupation during the lean season for fishermen are the crucial crux of problems to be discussed and decided. This needs co-ordination and intensive interaction between the researchers and technology users. The ATIC will provide a better opportunity for establishing a formal linkage between the scientists and technology users. This also serves as a single window delivery system

of the Institute with an objective to help the farmers and other stakeholders to get solution to their problems and make available all the technological information along with technology inputs.

Objectives

I. To provide a single window delivery system for the products and services available from the Institution to the fishermen and other interest groups as a process of innovativeness in technology dissemination at the Institute level.

II. To facilitate direct access to the fishermen to the Institutional resources available in terms of technology advice and technology products for reducing technology dissemination losses.

III. To provide mechanism for feed back from the users to the Institute.

Rationale

The rationale of the Agricultural Technology Information Centre at CMFRI are:

- Providing diagnostic services for soil testing and fish health
- Supplying research products such as fish seeds, processed products and other technological inputs emerging from the Institution for testing and adaptation by various clientele
- Disseminating information through published literature and communication materials as well as audio visual aids and
- Providing an opportunity to the Institute to have resource generation through the sales of technologies.

Criteria

The important criteria for the establishment of ATIC in CMFRI are

1. Availability and accessibility of new technologies
2. Relevance of new technologies
3. Responsiveness of new technologies to the needs of different categories of fishermen /farmers
4. Varied requirements for different categories of farmers and
5. Sustainability of such unit within the overall institutional frame work

By the incessant efforts of the scientists considerable pool of farm worthy techniques/technologies/knowledge materials have been developed in the Institute which can provide the techniques, technologies, and inputs such as seeds and feeds to the farmers and other organizations for taking up the frontier technologies to the field. This will facilitate in dealing effectively with the complexity and diversity of information systems and channels. Such information will be of use to

1. Fishermen
2. Farmers
3. Entrepreneurs
4. Industrialists
5. Extension workers
6. Development agencies
7. Non government organisations (NGOs)
8. Private sector organisations
9. Researchers
10. Teachers and Students

This centre will provide a 'balance score card' in terms of

1. Financial - Resource generation and financial sustainability
2. Customers - Measures on performance of technology from the customers point of view
3. Process - The performance of key internal process in terms of providing quality services and technological inputs; linkage with district extension system and spread of improved technology and enhanced productivity in the area
4. Feedback and learning - The ability of the research organisation to improve continuously and innovate products, services and processes

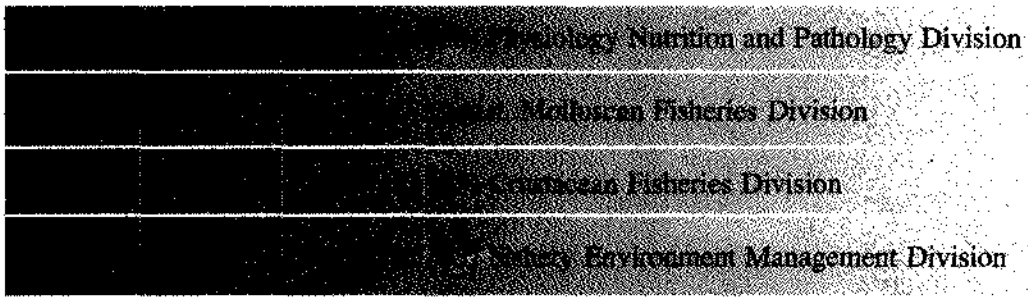
Operational frame work

CMFRI submitted a proposal on establishment of ATIC as per the guidelines provided by the NATP and it was approved by the ICAR and was sanctioned under the NATP during December 1999.

Organization of ATIC Team

The ATIC will function under the overall guidance of the Director of CMFRI, Cochin and assisted by a team of Scientists from different disciplines. The Head, SEETTD / ATIC Manager will serve as the leader of the ATIC team. As per the need of the fishermen, the scientist concerned will be contacted and they will be providing the necessary support for the fishermen regarding the technologies. The work includes taking the fishermen around the centre and discussing with them regarding their queries/ problems and to suggest remedial measures to be taken up by the farmers to solve their problems. If the farmers need further clarifications, other discipline experts will be contacted and also arrangements will be made to contact Regional/ Research centres of CMFRI through phone and internet to obtain the required information. Appropriate entries about the fishermen will be stored in the computer. A technical assistant is stationed permanently to explain about the various activities and services offered through ATIC. He/she will be in-charge of the sale of products and publications.

Functional collaboration of scientists with ATIC



4

FACILITIES

INFRASTRUCTURE FACILITIES

Conference hall

The conference hall has facilities to accommodate nearly 100 people and this facility can be used for organising conferences, seminars and other meetings.

ATIC library

The ATIC library is made to provide the facilities for the visiting fishermen / farmers to get them exposed to the available literature of the Institute .

Museum

Display materials, charts, posters, models, and mock ups depicting different technologies are kept in the museum.

Audio Visual hall

The scientists can take classes and make presentations with the help of LCD projector available at this centre. This hall has also facilities to screen video cassettes on different technologies.

Water analysis laboratory

The ATIC has got equipments for carrying out diagnostic services, soil and water testing and fish disease clinic to solve the immediate problems of the visiting farmers to the centre.

The other facilities available are scientists' room, store room and sales counter.

PRODUCTS SUPPLIED THROUGH ATIC

a. Shrimp feed
b. Shrimp meat
c. Edible oyster meat
d. Mussel meat
e. Pearls
f. Algal inoculum
g. Duplex PCR diagnostic Kit
h. Seaweed products such as
    (i) Agar agar
    (ii) Jelly
    (iii) Pickles

FACILITIES OFFERED THROUGH ATIC:

A. Providing direct access to farmers for information through exhibits, audio visual aids and farm literature on the following technologies

- Prawn farming/crab/lobster fattening and live transport
- Edible oyster culture
- Clam culture
- Pearl oyster farming and pearl production
- Finfish culture and live transport
- Sea cucumber culture
- Seaweed culture
- Shrimp feed production

B. Providing services like

- Slide shows
- Film shows
- Audio-Video programmes on mariculture technologies
- Environmental monitoring
- Microbiological analysis – Fish disease diagnosis

- Soil testing
- Water quality analysis
- Feed quality analysis.

C. Rendering assistance for training on

- Shrimp farming
- Crab/lobster fattening
- Bivalve culture
- Seaweed culture
- Finfish culture
- Live feed preparation
- Ornamental fish culture
- Scuba diving
- Computer application in marine fisheries
- Marine living resources survey
- Bioaquastics
- Fish stock assessment.

The technological inputs, products and services will be provided on nominal cost.

EQUIPMENTS

All the equipments available with the Institute will be used as and when required and the following equipments are procured exclusively for the use of ATIC.

1. Aqua kit
2. Compound microscope
3. Public address system
4. Slide projecter

Budget allocation (Rs. in lakh)

Sl. No.	Head/Sub-Head		2000-2001	2001-2002	2002-2003	Total
A.	**RECURRING**					
1	Pay & Allowances			-	-	-
2	Travelling Allowance			-	-	-
3	Training of ATIC staff @ 5 Scientists/ functionaries/Centres			-	-	0.050
4	Consultancy/contractual services			-	-	-
5	Operational expenses		1.275	1.275	1.275	10.100
	Sub Total (A)		1.275	1.275	1.275	10.150
B.	**NON-RECURRING**					
1	Equipment			-	-	1.425
2	Furniture			-	-	1.000
3	Works			-	-	30.000
4	Vehicle			-	-	-
5				-	-	-
	Sub Total (B)		Nil	Nil	Nil	32.425
	Grand Total (A+B)		1.275	1.275	1.275	42.575

WEB SITE

A web site **www.aticcmfri.org** is developed covering the following information.

1. Package of practices of all the technologies developed by the Institute
2. Schedule of training programmes organized by the Institute
3. Value addition and post-harvest technologies.
4. Technological inputs and services available in the Institute

Ask the Expert facility in the web page whereby the questions of the farmers are sent electronically to the ATIC will be forwarded to the concerned scientist and the answers will be posted on the web page so that farmers with similar questions or problems can easily access in the information while visiting the web site of this Centre.

The questions which are normally asked by the fishermen during scientists - farmers interaction will also be added in the website along with the reply of the scientist. This can be used by the farmers visiting the centre to satisfy their urge for knowing solution to their problems.

Crab Harvest Mela - an outcome of technology dissemination

5
ACTIVITIES AND ACHIEVEMENTS

a. SITE COMMITTEE

The first site committee was held on 8th December 2000 at the Central Marine Fisheries Research Institute with the following members

1.	Prof. Dr. Mohan Joseph Modayil, Director, CMFRI	Chairperson
2.	Dr. D. M. Thampy, Dean, College of Fisheries,KAU., Panangad	Member
3.	Ms. Valsa Augustine, AD, Dept of Agri. Govt. of Kerala, Kakkanad	Member
4.	Dr. George Mathan, Prof and Head, Dept of Animal Nutrition, KAU, Thrissur	Member
5.	Ms. Anitha Kumari, Scientist, CPCRI, Kayamkulam	Member
6.	Dr. P. K. Vijayan, Principal Scientist,CIFT, Cochin.	Member
7.	Dr. K. K. Appukuttan, Nodel Officer of NATP and Head, MFD	Member
8.	Dr. N. G. K. Pillai, Head, PFD	Member
9.	Dr. R. Paul Raj, Head, PNPD	Member
10.	Dr. A. Lakshminarayana, CTO, TTC	Member
11.	Dr. E. V. Radhakrishnan, Head, CFD	Member
12.	Dr. L. Krishnan, Principal Scientist, DFD	Member
13.	Dr. D. Noble, Sr. Scientist, PNPD	Member
14.	Mr. Charles Ekka, Sr. Adm Officer, CMFRI	Member
15.	Mr. Joseph George, AF&ACO, CMFRI	Member
16.	Ms. Sheela Immanuel, Manager, ATIC	Member
17.	Dr. R. Sathiadhas, Head, SEETTD	Member

The list of activities to be undertaken by the ATIC was presented by the ATIC Manager and the committee approved the same.

Decisions for implementation

- Decided to implement the single window delivery system concept for all the sales and products of the Institute through ATIC.
- All publications from the Institute and ATIC should be made available through ATIC and it will be supplied

at nominal cost

- Identification of collaborating scientists from different divisions to serve as resource personnel at ATIC
- ATIC should bring about need based publications.
- Procedure for sales of seeds, feed and other technological input through ATIC.
- Processed products and other inputs sold from other centres, a copy of invoice to be sent to ATIC
- Procedure for diagnostic services offered by the Institute.

The ATIC Manager presented the Activities in the II Site committee meeting held on 18 July, 2002 with the following members

1.	Prof. Dr. Mohan Joseph Modayil. Director, CMFRI, Cochin.	Chairperson
2.	Ms. Asha Devi Varma, Deputy Director of Agriculture. Govt. of Kerala Ernakulam	Member
3.	Dr. L. Krishnan, PS, DFD	Member
4.	Dr. Krishna Srinath, Head, EIS, CIFT, Cochin	Member
5.	Dr. P. K. Martin Thompson, OIC, KVK	Member
6.	Dr. D. Noble, Sr. Scientist, PNPD	Member
7.	Dr. M. Srinath, Head, FRAD	Member
8.	Dr. R. Paul Raj, Head, PNPD	Member
9.	Dr. M. J. Chandra Gowda, Senior Scientist, Zonal Coordinating Unit, Bangalore	Member
10.	Dr. S. Arul Raj. Head, Social Sciences Division, CPCRI, Kasaragod	Member
11.	Dr. K. K. Appukuttan, Nodel Officer of NATP and Head, MFD	Member
12.	Dr. V. S. R. Murthy, Head, DFD	Member
13.	Dr. E. V. RadhaKrishnan, Head, CFD	Member
14.	Dr. N. G. K. Pillai, Head, PFD	Member
15.	Mr. A. V. Joseph, Senior Finance & Accounts Officer, CMFRI	Member
16.	Ms. Sheela Immanuel, Manager, ATIC	Member
17.	Dr. R. Sathiadhas, Head, SEETTD	Member

Decisions taken for implementation

- It was decided to get some products from KAU, CPCRI and other institutes and it could be sold through ATIC.
- The processed products prepared by the women group under the IVLP project may be procured and sold through ATIC.
- Preparation of CDs on different technologies
- Web site designing and hosting

- Publication of Package of Practices of different technologies in Malayalam, Hindi and English
- Preparation of price list
- Preparation of leaflet and a brochure on ATIC
- Hot line facility to ATIC.

b. SERVICE TO FARMERS

The farmers / fishermen / industrialists and other entrepreneurs visiting the centre are taken around and explained the activities and functions of the centre. As and when required, their doubts are clarified. This helps the visitors to get a first hand information about the various technologies developed by the Institute.

c. PRICE LIST

A price list indicating the price of different publications and the rate for diagnostic services are displayed for the use of the visiting clients. List of publications and pamphlets on different technologies are also displayed. Photographs depicting the various technologies are kept for the benefit of the farmers.

d. TECHNICAL SERVICES

Technical services offered by the ATIC are as follows

❖ **Phone calls/Personal enquiry**

Phone calls received are regularly attended and the enquiries are mainly for the technical information on prawn farming, crab farming, fish disease diagnosis, small scale shrimp hatchery, feed, seed availability of fish, prawns and crab.

Letters

Request letters are mainly received for algal culture, PCR test, stereo-microscopic and electron microscopic work, zooplankton and feed composition analysis.

Divisions supplying major inputs to ATIC

Input/services	Division
1. Soil and water quality analysis	FEMD
2. Disease diagnostic services	PNPD
3. Feed quality analysis	PNPD
4. Supply of shrimp feed	PNPD
5. Inoculam supply	FEMD
6. Seaweed products	FEMD
7. Supply of shrimp seed	KVK
8. Supply of pearl	MFD
9. Prawn/crab farming	CFD
10. Bivalve culture	MFD
11. Electron microscopy	PNPD
12. Publication, Video cassette, CD	SEETTD

Major farm queries and services

Queries	Suggestions given
Shrimp disease	Better management practices
Quality seed selection	Polymerase Chain Reaction (PCR) test
Water problems	Water quality analysis
Availability of seeds	Information on approved hatcheries
Finfish culture	Technical information given on different culture practices
Bivalve mariculture	Technical guidance on different bivalve mariculture
Preparation of shrimp feed	Technical assistance for arranging training on feed production.

Suggestion book

A suggestion book is maintained in ATIC which is helping to get feed back from farmers to the research scientists.

Inter-disciplinary efforts

Since the farmers/clients visiting this centre require information on different aspects of capture and culture fisheries, scientists working in different disciplines are contacted for giving appropriate technical guidance as and when required. A multi-disciplinary team is actively involved in the ATIC activities.

e. IMPACT OF THE PROJECT

- 3638 farmers/fishermen / entrepreneurs visited
- Sale of product/services benefited around 1250 farmers
- ATIC provided the farmers with the information on technologies and helped them to get quality seeds and products
- Diagnostic services and analysis are made easier and it helped the farmers to get the results of the water quality parameters in stipulated time.
- Feed back received from the fisherfolk helped the researchers to bring about refinements in the technologies.
- Co-ordination among the different divisions in the Institute was strengthened.
- ATIC helped to enhance linkages with other organizations.
- The number of farmers visiting the Institute increased
- Interaction of the farmers with the scientists was made easier.
- The queries from the farmers were answered quickly.
- Income generation of the Institute was enhanced due to ATIC.

f. FEEDBACK FROM TECHNOLOGY

Feed back to the scientists regarding the technologies, being adopted by the fishermen/ farmers in their farms are given to the scientists. Some of the feed back information are as follows

Control measures for virus disease

Availability of seeds

Feed availability and supply

Training on

(a) Marine ornamental fish culture
(b) Bivalve culture.
(c) Crab farming
(d) Scientific prawn farming

The constraints faced by the farmers are brought to the knowledge of the scientists and this would help the researchers to refine the technologies.

g. COLLABORATION AND LINKAGE

This centre has got good linkages with organisations such as Central Institute of Fisheries Technology (CIFT), Marine Products Export Development Authority (MPEDA), Integrated Fisheries Project (IFP), Brackishwater Fish Farmers Development Agency (BFFDA), Fish Farmers Development Agency (FFDA), Agency for Development of Aquaculture (ADAK), Central Plantation Crops Research Institute (CPCRI) and Kerala Agricultural University (KAU).

The ATIC activities are well supported by the administrative wing of the Institute and ICAR.

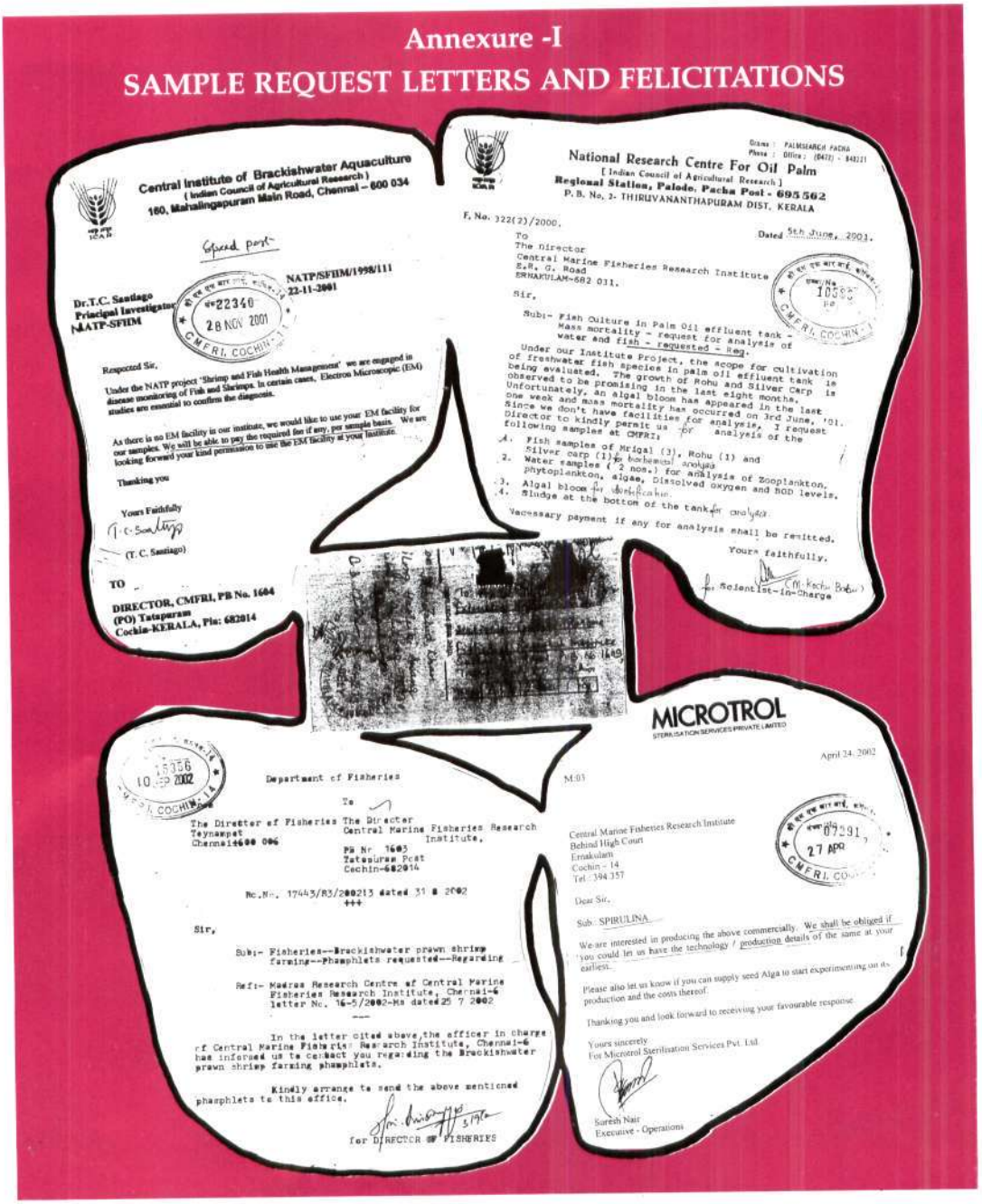
h. ATIC - FOR THE BETTERMENT OF FISHING COMMUNITY

ATIC is a multi disciplinary facility providing technological information and services to a wider category of fishermen / farmers and other endusers both at regional and national level. It is acting as a bridge between the fishermen and scientists and thereby enhancing the linkage between the research and client system. Dissemination loss could be prevented to the extent possible with the existing ATIC facilities. With the concerted efforts and co-operation of both researchers and fishermen this Centre is expected to bring about considerable impact in the livelihood of the fishermen community.

Krishi Diwas - recognition to innovative fisherfolk

6
ANNEXURES

Annexure -I
SAMPLE REQUEST LETTERS AND FELICITATIONS



Central Institute of Brackishwater Aquaculture
(Indian Council of Agricultural Research)
160, Mahalingapuram Main Road, Chennai – 600 034

Speed Post

Dr.T.C. Santiago
Principal Investigator
NATP-SFIHM

NATP/SFIHM/1998/111
22-11-2001

Respected Sir,

Under the NATP project 'Shrimp and Fish Health Management' we are engaged in disease monitoring of Fish and Shrimps. In certain cases, Electron Microscopic (EM) studies are essential to confirm the diagnosis.

As there is no EM facility in our institute, we would like to use your EM facility for our samples. We will be able to pay the required fee if any, per sample basis. We are looking forward your kind permission to use the EM facility at your Institute.

Thanking you

Yours Faithfully

(T. C. Santiago)

TO

DIRECTOR, CMFRI, PB No. 1604
(PO) Tatapuram
Cochin-KERALA, Pin: 682014

National Research Centre For Oil Palm
[Indian Council of Agricultural Research]
Regional Station, Palode, Pacha Post - 695 562
P. B. No, 2- THIRUVANANTHAPURAM DIST. KERALA

F. No. 322(2)/2000.

Dated 5th June, 2003.

To
The Director
Central Marine Fisheries Research Institute
S.R. G. Road
ERNAKULAM-682 031.

Sir,

Subj:- Fish Culture in Palm Oil effluent tank - Mass mortality - request for analysis of water and fish - requested - Reg.

Under our Institute Project, the scope for cultivation of freshwater fish species in palm oil effluent tank is being evaluated. The growth of Rohu and Silver Carp is observed to be promising in the last eight months. Unfortunately, an algal bloom has appeared in the last one week and mass mortality has occurred on 3rd June, '01. Since we don't have facilities for analysis, I request Director to kindly permit us for analysis of the following samples at CMFRI:

1. Fish samples of Mrigal (3), Rohu (1) and Silver carp (1) for biochemical analysis
2. Water samples (2 nos.) for analysis of Zooplankton, phytoplankton, algae, Dissolved oxygen and BOD levels.
3. Algal bloom for identification.
4. Sludge at the bottom of the tank for analysis.

Necessary payment if any for analysis shall be remitted.

Yours faithfully,

for Scientist-in-Charge

Department of Fisheries

To

The Director of Fisheries
Teynampet
Chennai-600 006

The Director
Central Marine Fisheries Research Institute,
PB Nr. 1603
Tatapuram Post
Cochin-682014

Rc.No. 17443/B3/200213 dated 31 8 2002

Sir,

Subj:- Fisheries--Brackishwater prawn shrimp farming--Phamphlets requested---Regarding

Ref:- Madras Research Centre of Central Marine Fisheries Research Institute, Chennai-6 letter No. 16-5/2002-Ms dated 25 7 2002

In the letter cited above, the officer in charge of Central Marine Fisheries Research Institute, Chennai-6 has informed us to contact you regarding the Brackishwater prawn shrimp farming phamphlets.

Kindly arrange to send the above mentioned phamphlets to this office.

for DIRECTOR OF FISHERIES

MICROTROL
STERILISATION SERVICES PRIVATE LIMITED

April 24, 2002

M:03

Central Marine Fisheries Research Institute
Behind High Court
Ernakulam
Cochin - 14
Tel : 394 357

Dear Sir,

Sub: SPIRULINA

We are interested in producing the above commercially. We shall be obliged if you could let us have the technology / production details of the same at your earliest.

Please also let us know if you can supply seed Alga to start experimenting on its production and the costs thereof.

Thanking you and look forward to receiving your favourable response.

Yours sincerely
For Microtrol Sterilisation Services Pvt. Ltd.

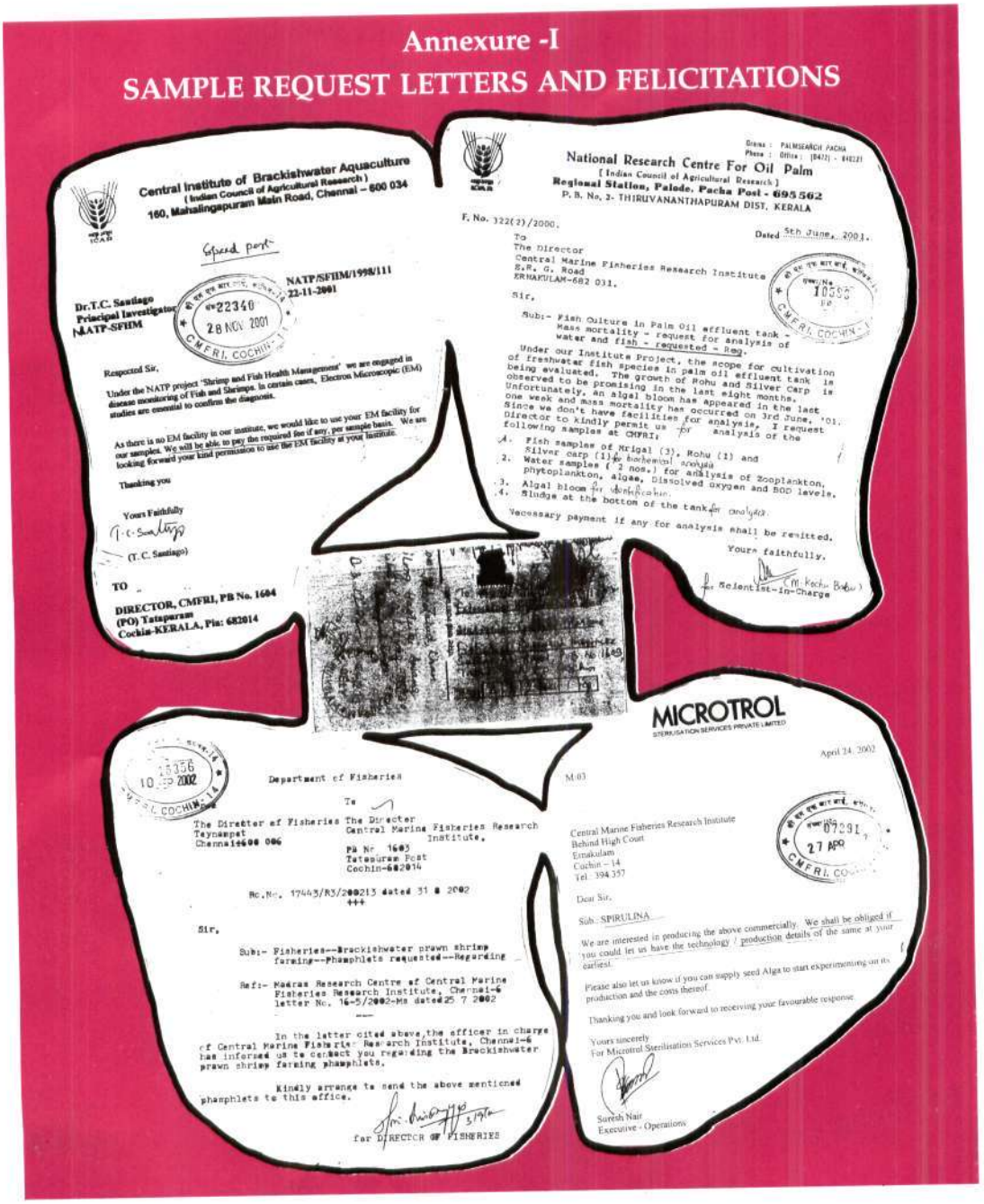
Suresh Nair
Executive - Operations

6

ANNEXURES

Annexure -I

SAMPLE REQUEST LETTERS AND FELICITATIONS



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Taynampet
Chennai-600 006

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Central Marine Fisheries Research Institute,
PB No. 1603
Tatapuram Post
Cochin-682014

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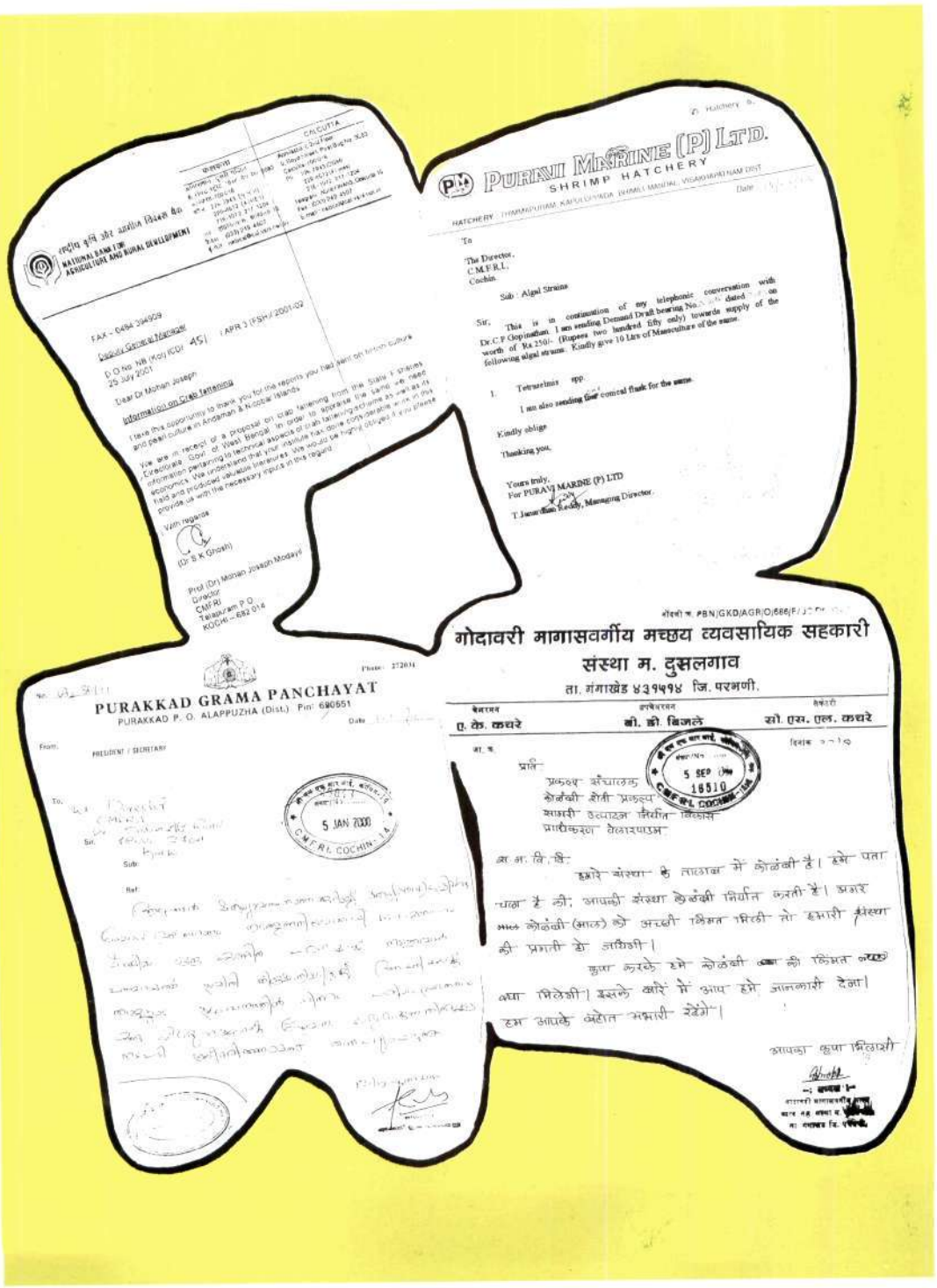

NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT

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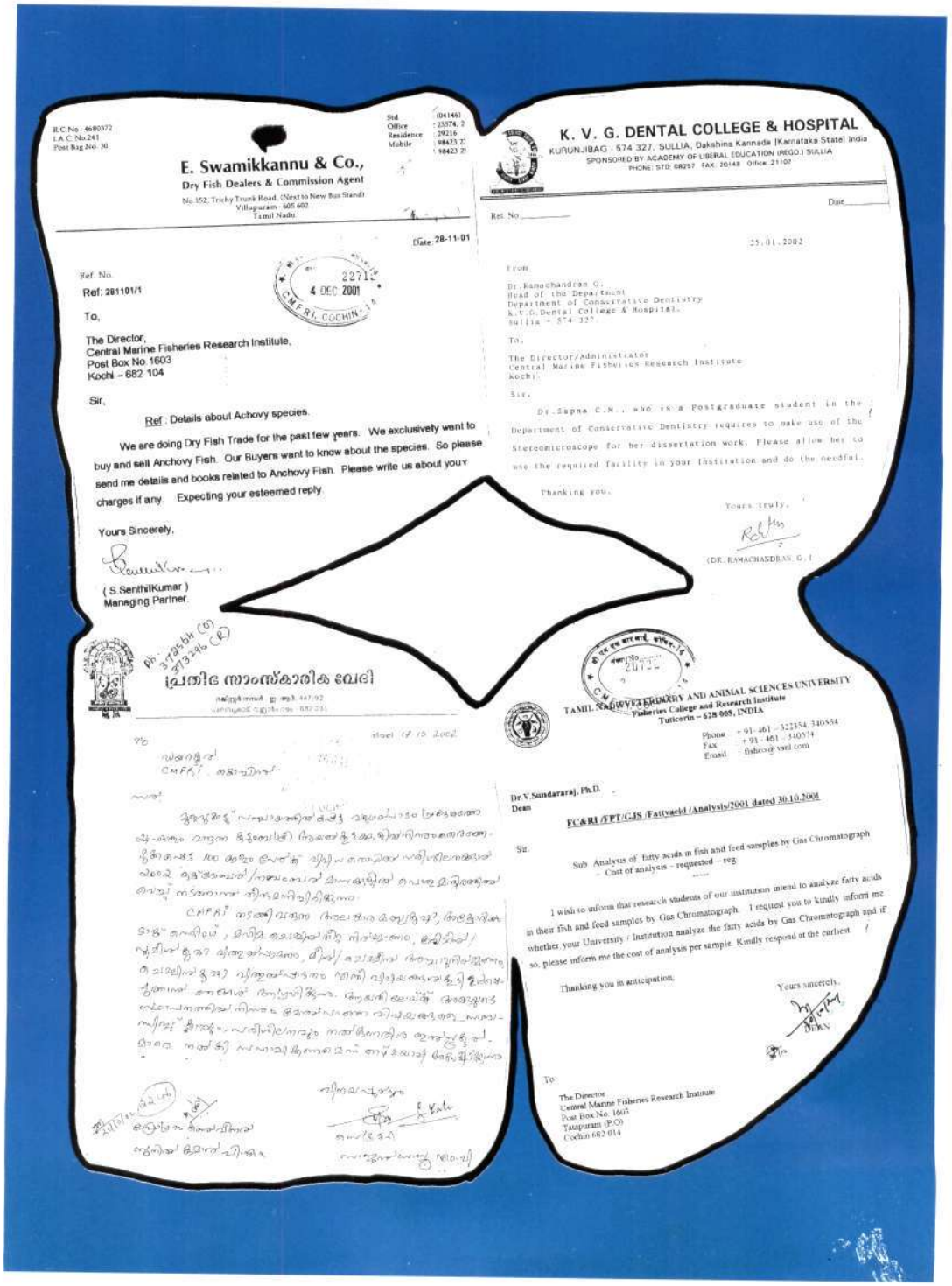
गोदावरी मागासवर्गीय मच्छय व्यवसायिक सहकारी संस्था म. दुसलगाव
ता. गंगाखेड ४३१५१४ जि. परभणी.

5 JAN 2000
CMFRI, COCHIN-18

5 SEP (19) 18510
CMFRI, COCHIN-18



R.C.No : 4680372
I.A.C.No.241
Post Bag No. 30

E. Swamikkannu & Co.,
Dry Fish Dealers & Commission Agent
No.152, Trichy Trunk Road, (Next to New Bus Stand)
Villupuram - 605 602
Tamil Nadu

Std (04146)
Office : 23574, 2
Residence : 29216
Mobile : 98423 2
: 98423 2

Date: 28-11-01

Ref. No.
Ref: 281101/1

CMFRI, COCHIN-18 22712 4 DEC 2001

To,

The Director,
Central Marine Fisheries Research Institute,
Post Box No.1603
Kochi – 682 104

Sir,

Ref : Details about Achovy species.

We are doing Dry Fish Trade for the past few years. We exclusively want to buy and sell Anchovy Fish. Our Buyers want to know about the species. So please send me details and books related to Anchovy Fish. Please write us about your charges if any. Expecting your esteemed reply.

Yours Sincerely,

(S.SenthilKumar)
Managing Partner.

Ph. 32985h (O)
373348 (R)

ചേതിഭ സാംസ്കാരിക വേദി

K. V. G. DENTAL COLLEGE & HOSPITAL
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Ref. No. _____ Date _____

25.01.2002

From

Dr.Ramachandran G.
Head of the Department
Department of Conservative Dentistry
K.V.G.Dental College & Hospital,
Sullia - 574 327.

To,

The Director/Administrator
Central Marine Fisheries Research Institute
Kochi.

Sir,

Dr.Sapna C.N., who is a Postgraduate student in the Department of Conservative Dentistry requires to make use of the Stereomicroscope for her dissertation work. Please allow her to use the required facility in your Institution and do the needful.

Thanking you.

Yours truly,

(DR.RAMACHANDRAN. G.)

CMFRI 20122 2 JAN 2002

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY
Fisheries College and Research Institute
Tuticorin – 628 008, INDIA

Phone : + 91 - 461 - 322354, 340554
Fax : + 91 - 461 - 340574
Email : fishco@vsnl.com

Dr V.Sundararaj, Ph.D.
Dean

FC&RI /FPT/GJS /Fattyacid /Analysis/2001 dated 30.10.2001

Sir,

Sub: Analysis of fatty acids in fish and feed samples by Gas Chromatograph – Cost of analysis – requested – reg.

I wish to inform that research students of our institution intend to analyze fatty acids in their fish and feed samples by Gas Chromatograph. I request you to kindly inform me whether your University / Institution analyze the fatty acids by Gas Chromatograph and if so, please inform me the cost of analysis per sample. Kindly respond at the earliest.

Thanking you in anticipation.

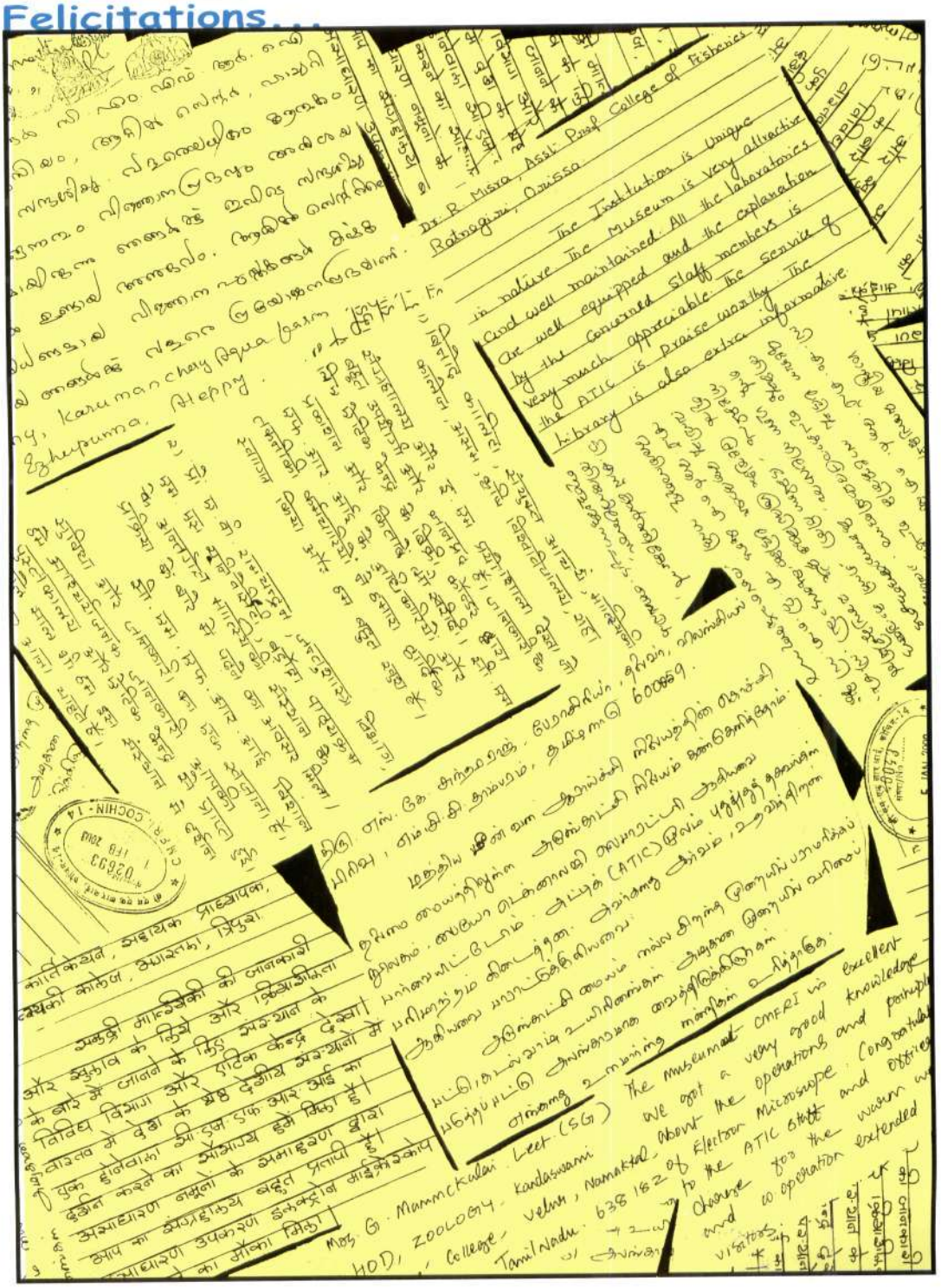
Yours sincerely,

DEAN

To

The Director
Central Marine Fisheries Research Institute
Post Box No. 1603
Tatapuram (P.O)
Cochin 682 014

Felicitations...



Annexure II

PRICE LIST

Publications (Malayalam, Hindi and English)

	Name of the Publication	Price (Rs.)
1.	*Mahima* shrimp feed	5/-
2.	Mussel culture	5/-
3.	Crab culture	5/-
4.	Oyster culture	5/-
5.	Pearl culture	5/-
6.	Clam culture	5/-
7.	Fish disease	5/-
8.	Small-scale shrimp hatchery	5/-
9.	Eco friendly prawn farming	15/-
10.	Aquarium fish keeping	10/-
11.	Artificial fish habitats	15/-
12.	Marine fisheries management for sustainable development	10/-

Details of charges for analysis of samples.

	Name of analysis	Rate / sample (Rs.)
1.	Temperature	45/-
2.	Salinity	55/-
3.	Dissolved Oxygen	50/-
4.	Inorganic Phosphate	55/-
5.	Nitrate	55/-
6.	Nitrite	55/-
7.	Silicate	55/-
8.	COD	150/-
9.	pH	35/-
10.	Ammonia	80/-
11.	B.O.D	125/-
12.	Metals	375/-
13.	Total Dissolved Solid (TDS)	100/-
14.	Total Suspended Solid (TSS)	100/-
15.	PCR Test for whitespot disease	500/-
16.	Cost effective Duplex PCR kit for detection of whitespot virus	
	(a) 50 Reaction kit	10,000/-
	(b) 25 Reaction kit	5000/-

Sediment parameter	**Rate / Sample (Rs.)**
pH	25/- sample
Organic carbon	50/- sample
Available Phosphorus	50/- sample
Available Potassium	30/- sample
Grain size analysis	500/- sample
Phytoplankton identification	250/- sample
Estimation of Chlorophyll	250/- sample
Heavy metals	250/per metal per sample
Inoculum	**Rate (Rs.)**
Micro-algae	100/100ml /species
Chaetoceros sp	"
Isochrysis galbana	"
Tetraselmis gracilis	"
Nannochloropsis salina	"
Chlorella marina	"
Dunaliella salina	"
Spirulina sp. (fresh water form)	"
Assessment of primary productivity of water (GPP& NPP)	1000/-per pond or station
Assessment of Biochemical Oxygen Demand (BOD) in water.	1000/-per pond or station
For both together (P.P.& BOD)	1500/- per pond or station
Zooplankton	**Rate (Rs.)**
1. Single sample of representative of zooplankton with the container	200/-
2. Identification of GroupWise analyses of an aliquot portion of the zooplankton sample.	1, 000/-
3. Identification and Numerical estimation of zooplankton per group from a given sample.	2, 500/-

Annexure- III

YEAR-WISE DETAILS OF ACTIVITIES

a) Technological inputs sold/supplied

April 2000- Dec 2000

Sl. No	Technological Inputs	Quantity(Kg)	Value (Rs)	No. of beneficiaries		Total
				Farmers	Others	
1	Algal inoculum	5000ml	5,000	12	30	42
2	Pearl	-	60,000	-	25	25
	Total	-	65,000	12	55	67

Jan 2001- Dec 2001

Sl. No	Technological Inputs	Quantity(Kg)	Value (Rs)	No. of beneficiaries		Total
				Farmers	Others	
1	Algal inoculum	26,960 ml	26,960	18	82	100
2	Zooplankton	2000ml	2,000	-	10	10
3	Shrimp	1.5 tonnes	3,00,000	-	2	2
4	Mussel meat	1.7 tonnes	35,000	-	3	3
5	*Mahima* shrimp feed	25 kg	1,250	4	-	4
	Total	-	3,65,210	22	97	119

Jan 2002- Dec 2002

Sl. No	Technological Inputs	Quantity(Kg)	Value (Rs)	No. of beneficiaries		Total
				Farmers	Others	
1	Algal inoculum	36,400 ml	36,400	25	102	127
2	Zooplankton	800 ml	800	-	03	3
3	Feed composition analysis	7 samples	3,500	-	03	3
4	Charges for electron microscopic work	10 samples	19,250	-	04	4
5	P.C.R. test charges	24 samples	8,500	14	04	18
6	Water analysis	5 samples	11,745	03	02	5
7	Shell identification charges	5 samples	950	-	05	5
8	Stereo microscopic work	3 samples	600	-	03	3
9	Pearl	350 g	2,13,000	-	45	45
10	Oyster meat	2 kg	100	-	-	-
	Total	-	2,94,845	42	171	213

b. Publications distributed free of cost (1999 - 2000)

Title of publication	Number	No. of beneficiaries
Mussel culture	52	52
Marine fisheries management for sustainable development	22	22
Crab farming	60	42
Fish disease	55	55
Pearl culture	30	30
Mahima Shrimp feed	40	36
Oyster farming	23	21
Artificial reef	12	12
Shrimp hatchery	21	21
Prawn farming	43	33
Clam farming	4	4
Aquarium fish keeping	65	65
Total	427	393

Publications sold through the ATIC-Booklets/Pamphlets

Jan 2001 to Dec 2001

Title of publication	No. sold	Value (Rs)	No.of beneficiaries		Total
			Farmers	Others	
Aquarium fish keeping	38	380	18	20	38
Mussel culture	34	170	34	-	34
Marine fisheries management for sustainable development	29	290	-	29	29
Crab farming	42	210	38	04	42
Fish disease	29	145	26	03	29
Pearl culture	34	170	14	20	34
Mahima shrimp feed	17	85	12	05	17
Oyster farming	38	190	30	08	38
Artificial reef	24	360	14	10	24
Shrimp hatchery	38	190	10	28	38
Prawn farming	9	135	07	02	9
Clam farming	4	20	04	-	4
Library	-	1,45,000	-	-	-
Total	336	1,47,345	207	129	336

Jan 2002 to Dec 2002

Title of publication	No. sold	Value (Rs)	No.of beneficiaries		Total
			Farmers	Others	
Aquarium fish keeping	39	390	30	09	39
Mussel culture	18	90	12	06	18
Marine fisheries management for sustainable development	24	240	06	18	24
Crab farming	27	135	25	02	27
Fish disease	7	35	4	3	7
Pearl culture	9	45	06	03	9
Mahima shrimp feed	17	85	10	07	17
Oyster farming	18	90	12	06	18
Artificial reef	13	195	04	09	13
Shrimp hatchery	30	150	02	28	30
Prawn farming	4	60	04	-	4
Clam farming	9	45	09	-	9
ICAR publications	-	1325	-	-	-
Library	-	1,28,584	-	-	-
Total	215	1,31,469	130	91	215

c) Diagnostic services provided

April 2000 – Dec 2000

Sl. No	Diagnostic services	No. of samples tested	No.of beneficiaries
1	Water sample analysis	24	24
2	Feed composition analysis	12	10
3	E.M. Work	12	08
4	Mud sample	08	08
5	Disease diagnosis	38	30
	Total	94	80

Jan 2001 – Dec 2001

Sl. No	Diagnostic services	No. of samples tested	Fees charged (Rs)	No.of beneficiaries		Total
				Farmers	Others	
1	Feed composition analysis	10	1,500	06	04	10
2	Water sample analysis	42	8,400	24	14	38
3	E.M. work	-	3,800	-	3	3
4	Mud sample analysis	-	2,000	20	6	26
5	Disease diagnosis	06	3,000	04	02	06
	Total	58	18,700	54	29	83

Jan 2002 – Dec 2002

Sl. No	Diagnostic services	Cost (Rs)	No. of samples tested	No.of beneficiaries		Total
				Farmers	Others	
1	Feed composition analysis	3,500	7	-	3	3
2	Electron microscopic work	19,500	3	-	3	3
3	Water analysis	11,745	4	-	4	4
4	Shell identification	950	5	-	5	5
5	Stereo microscopic work	600	1	-	1	1
6	PCR test charges	8,500	15	4	11	15
	Total	44,995	35	4	27	31

d) Farm advisory services provided to farmers and other stakeholders
April 2000-Dec 2000

Sl. No	Advisory services	Personal visit	Letters	Telephone helpline	Total
1	Prawn farming	148	12	40	200
2	Bivalve culture	32	8	15	55
3	Shrimp feed	45	22	72	139
4	Shrimp hatchery	20	4	4	28
5	Fish disease	40	13	3	56
6	Crab culture / fattening	185	18	53	256
7	Training	15	22	18	55
8	CMFRI/ATIC Services	651	42	38	731
	Total	1136	141	243	1520

Jan 2001-Dec 2001

Sl. No	Advisory services	Personal visit	Letters	Telephone helpline	Farmers field visit	Total
1	Prawn farming	154	8	35	15	212
2	Bivalve culture	45	4	22	-	71
3	Shrimp feed	65	15	34	08	122
4	Shrimp hatchery	34	6	18	-	58
5	Fish disease	60	15	45	-	120
6	Crab culture	154	18	38	32	242
7	Training	22	12	20	-	54
	Total	534	78	212	55	879

Jan 2002-Dec 2002

Advisory services	Personal visit	Letters	Telephone helpline	Farmers field visit	Total
Prawn farming	40	3	18	5	66
Bivalve culture	12	8	2	-	22
Shrimp feed	10	6	11	-	27
Fish disease	11	1	20		32
Crab farming	30	9	5	12	56
Shrimp hatchery	25	8	8	-	41
Ornamental fish culture	02	03	04	-	09
Fish disease management	15	07	16	-	38
Training	08	10	12	-	30
CMFRI/ATIC services	460	16	12	-	488
Others	1358	36	22	-	1416
Total	1971	107	130	17	2225

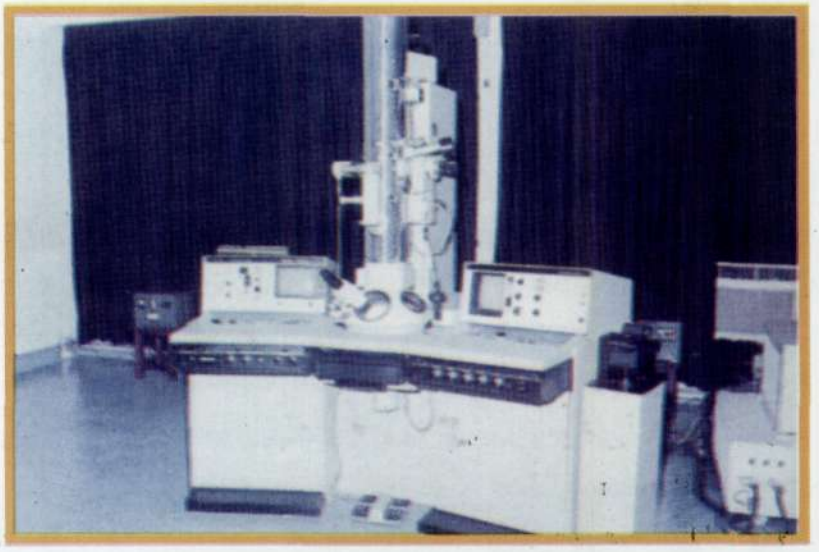
e) Visit of farmers and other stakeholders to ATIC (April 2000- Dec 2002)

YEAR	Purpose of visit	Farmers		Others	Repeated visitors	Total
		M	F			
2000	Information and inputs	410	75	651	32	1168
2001	;;	512	30	1358	48	1948
2002	;;	542	18	460	28	1048
	Total	1464	123	2469	108	4164

Annexure IV

SELECT LIST OF ORGANISATIONS FREQUENTLY BENEFITTED BY THE SERVICES OF ATIC

ATIC Services	Organisations benefitted
Sample analysis of fish	National Research Centre for Oil Palm, Palode, Pacha PO – 695 562
Electron microscopy service	Rubber Research Institute, Kottayam, Kerala
Analysis of water samples	Hindustan Lever Ltd, Baikady Village,Brahmavar 576 213, Udipi District
Stereomicroscopic work	Department of Conservative Dentistry, K.V.G.Dental College, Sullia, Mangalore
Mahima shrimp feed	Department of Marine Biology, Cochin University of Science and Technology, Thrikkakara, Cochin-22
Technology for procurement of fish silage	Lilong Haorika Awang, Manipur, Assam
Feed composition analysis	Fisheries Biology, School of Applied Life Science (Mahatma Gandhi University) Pathanamthitta, Kerala.



Electron Microscope - optimal utility

Annexure V

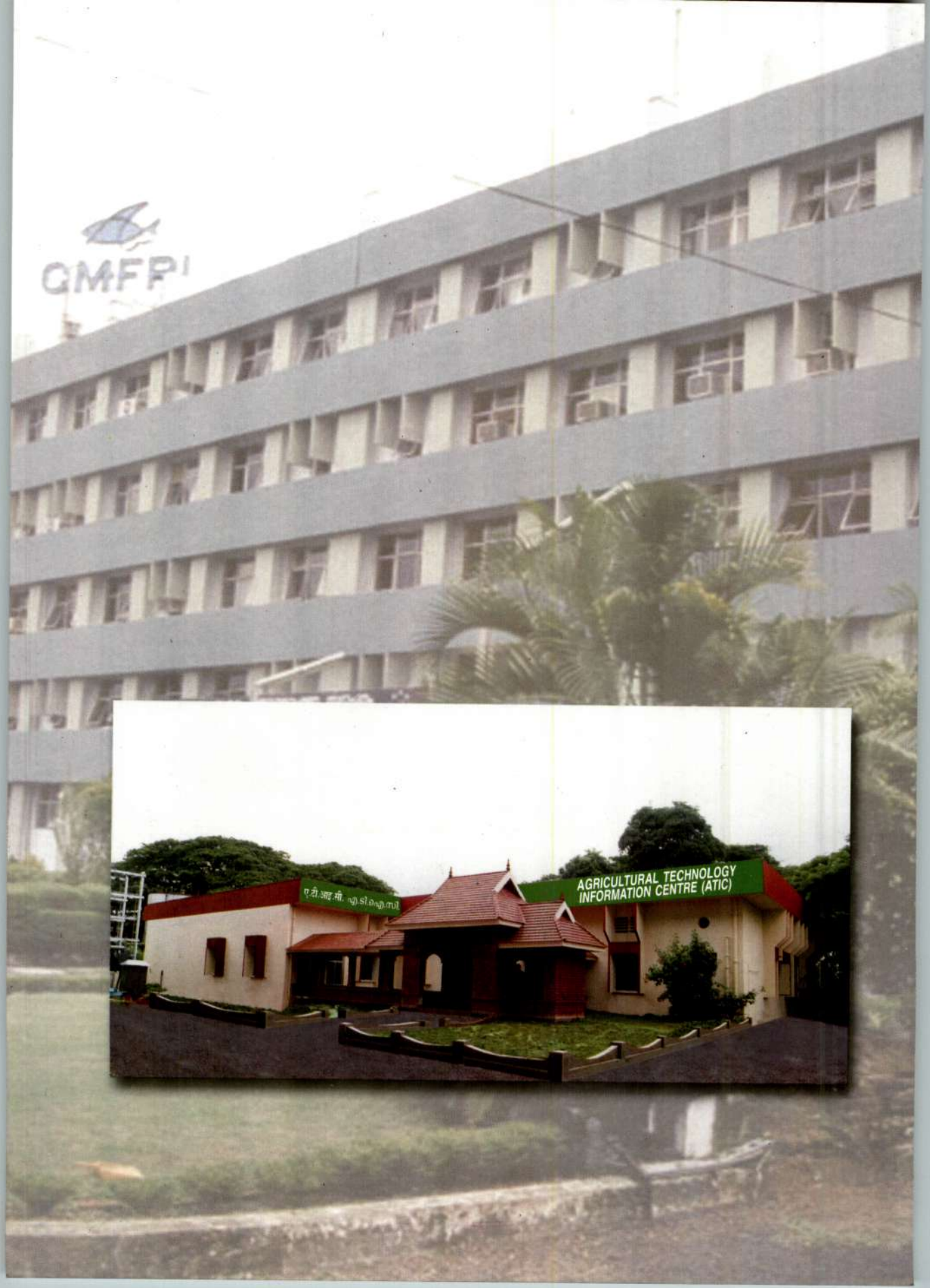
LIST OF FISHERMEN - FARMERS - INDUSTRY - INSTITUTION - MEETS (SEETTD / ATIC)

Sl. No.	Date	Title	Place
1.	02-05-1995	Mussel farming	HQ, Cochin
2.	05-06-1995	Fisheries management for sustainable development	HQ, Cochin
3	03-07-1995	Mud crab farming	HQ, Cochin
4	07-08-1995	Fish diseases	HQ, Cochin
5	13-09-1995	Pearl culture	HQ, Cochin
6	09-10-1995	*Mahima* shrimp feed	HQ, Cochin
7	06-11-1995	Edible oyster farming	HQ, Cochin
8	20-12-1995	Artificial fish habitats	HQ, Cochin
9	23-01-1996	Mini shrimp hatchery	HQ, Cochin
10	24-02-1996	Fisheries management for sustainable shrimp farming	HQ, Cochin
11	19-03-1996	Clam culture	HQ, Cochin
12	30-04-1996	Integrated mariculture	HQ, Cochin
13	17-06-1996	Assessment of CMFRI's sea farming programmes	HQ, Cochin
14	11-07-1996	Seaweed culture	HQ, Cochin
15	17-08-1996	Ornamental fish culture	HQ, Cochin
16	20-11-1996	Problems and prospects of small scale fisheries in Kerala	HQ, Cochin
17	24-01-1997	Futurology of marine fisheries	HQ, Cochin
18	20-02-1997	Labour situation of marine fisheries in Kerala	HQ, Cochin
19	01-03-1997	Credit and saving schemes for coastal community	Chellanam
20	05-04-1997	Sea farming technologies	Narakkal
21	30-05-1997	Oyster and finfish culture	Kadamakkudy
22	27-06-1997	Fisheries awareness camp	Kandakkadavu
23	28-08-1997	Fish culture	Chellanam
24	22-09-1997	Mussel farming	Manassery

25	28-10-1997	Crab farming	Kumbalangi
26	25-11-1997	Prawn farming	Valappu
27	07-01-1998	Crab harvest mela	Chellanam
28	19-02-1998	Mycotoxin in feed	Cochin
29	28-04-1998	Clam farming	Muhamma
30	26-05-1998	Fin-fish culture	Kattikkunnu
31	17-07-1998	Crab culture	Panampukadu
32	16-10-1998	Prawn farming	Panampukadu
33	18-05-1999	Ornamental fish culture	Udayamperur
34	15-07-1999	Finfish culture	Puthuvyppu
35	30-08-1999	Clam culture	Kuthiathode
36	29-09-1999	Crab culture	Panampukadu
37	27-10-1999	Credit and saving schemes for coastal community	Panampukadu
38	29-11-1999	Utilization of low cost fish	Panampukadu
39	29-01-2000	*Etroplus* breeding and culture	Kadamakkudy
40	11-04-2000	Self-help group for fisherwomen	Panambukadu
41	15-07-2000	*Mahima* shrimp feed	Valappu
42	30-01-2001	Prawn farming	Kumbalam
43	30-10-2001	Crab farming	Azhicode
44	15-11-2001	Finfish culture	Udayamperur
45	04-12-2001	Prawn farming	Panambukadu

For further information please contact:

The Director,
Central Marine Fisheries Research Institute
(Indian Council of Agricultural Research)
Post Box No. 1603, Tatapuram (PO), Cochin-14,
Kerala, India.
Tel: (0484) 2394867, 2391407 Fax- +91-484-2394909
E-mail- **cmfriatic@rediffmail.com**
Website : www.aticcmfri.org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AGRICULTURAL TECHNOLOGY
INFORMATION CENTRE (ATIC)